# PHYSICAL REVIEW E

## STATISTICAL, NONLINEAR, AND SOFT MATTER PHYSICS


***Editor***

**GARY S. GREST**
(Sandia National Laboratories)

***Associate Editors***

**MICHAEL BRENNER**
(Harvard University)

**BURKHARD DUENWEG**
(Max-Planck-Institut fuer Polymerforschung)

**BRANT M. JOHNSON**
(Brookhaven National Laboratory)

**MARGARET MALLOY**
(APS Editorial Office)

**ANTONIO POLITI**
(Istituto Nazionale di Ottica Applicata)

**MARK SAFFMAN**
(University of Wisconsin)

**JONATHAN SELINGER**
(Naval Research Laboratory)

**ROBERT ZIFF**
(University of Michigan)

***Senior Assistant Editor***

**MARGARET FOSTER**

***Assistant Editors***

**DIRK JAN BUKMAN**
**JILL M. GARGANO**
**VALERIE L. MILLER**
**JOANNA POPADIUK**

***Editorial Assistant***

**JOYCE MASTERSON**

*EDITORIAL BOARD*

*Term ending 31 December 2004*

| | |
|---|---|
| A. AHARONY | Critical Phenomena, Percolation |
| A. ALBANO | Statistical Physics, Chaos |
| J.-P. BOUCHAUD | Statistical Physics |
| W. FIRTH | Nonlinear Optics, Optical Patterns, Solitons |
| I. FREUND | Statistical Optics, Singular Optics |
| H. A. GOULD | Computational Physics |
| R. KAPRAL | Statistical Mechanics, Nonlinear Dynamics |
| J. KRUG | Statistical Physics |
| Y. POMEAU | Fluid Mechanics, Kinetic Theory |
| J. SOMMERER | Experimental Chaos |
| H. SOMPOLINSKY | Disordered Systems, Spin Glasses, Neural Networks |
| P. W. TALKNER | Statistical Physics |
| R. TEMKIN | Beam Physics |
| A. G. YODH | Complex Fluids, Optics |

*Term ending 31 December 2005*

| | |
|---|---|
| N. ABRAHAM | Chaos, Nonlinear Dynamics, Optics |
| J. CARY | Plasmas |
| P. HÄNGGI | Statistical and Stochastic Physics |
| O. LAVRENTOVICH | Liquid Crystals |
| D. LOHSE | Turbulence |
| E. MARX | Classical and Quantum Physics |
| A. PIKOVSKY | Nonlinear Physics |
| S. J. SCHIFF | Biological Physics |
| M. WORTIS | Biological and Statistical Physics |

*Term ending 31 December 2006*

| | |
|---|---|
| H. AREF | Fluid Dynamics |
| J. BECHHOEFER | Complex Fluids, Biological Physics |
| E. BEN-NAIM | Granular Materials |
| B. ECKHARDT | Classical Chaos, Quantum Chaos |
| M. GLASER | Liquid Crystals |
| C. MOUKARZEL | Statistical Physics |
| R. PODGORNIK | Polymer Physics, Boilogical Physics |
| S. RAMASWAMY | Complex Fluids |
| T. ROSER | Beam Physics |
| B. SCHMITTMANN | Statistical Physics |



**The American Physical Society**
One Physics Ellipse
College Park, MD 20740-3844

| | |
|---|---|
| *President* | HELEN R. QUINN |
| *President-Elect* | MARVIN L. COHEN |
| *Vice-President* | JOHN BAHCALL |
| *Editor-in-Chief* | MARTIN BLUME |
| *Treasurer and Publisher* | THOMAS J. MCILRATH |
| *Executive Officer* | JUDY R. FRANZ |

**APS Editorial Office**
1 Research Road, Box 9000
Ridge, NY 11961-9000

Phone: (631) 591-4050
Fax: (631) 591-4141
Email: pre@aps.org
Web: http://publish.aps.org/
Submissions: pretex@aps.org or
http://publish.aps.org/ESUB/

Member Subscriptions:

**APS Membership Department**
One Physics Ellipse
College Park, MD 20740-3844
Phone: (301) 209-3280
Fax: (301) 209-0867
Email: membership@aps.org

Institutional Subscriptions:

**APS Subscription Services**
Suite 1NO1
2 Huntington Quadrangle
Melville, NY 11747-4502
Phone: (516) 576-2270, (800) 344-6902
Fax: (516) 349-9704
Email: subs@aps.org


**Manuscripts** should be **submitted** electronically in acceptable format (see `http://publish.aps.org/ESUB/` or inquire at pretex@aps.org). If this is not possible, send four copies to the Editorial Office. Submission is a representation that the manuscript has not been published previously and is not currently under consideration for publication elsewhere. Authors should provide indexing codes according to the PACS scheme (available at `http://publish.aps.org/PACS/`). An executed APS **copyright-transfer** form must be provided (effective only on acceptance for publication); the form is available on the APS Web server and appears at the end of the 25 June 2004 issue of *Physical Review Letters*. Information for contributors may be found on our Web server or in the January and July issues.

To help defray editorial and production expenses, authors of articles which are not submitted in acceptable electronic format are expected to pay a **publication charge** of $110 plus $110 per journal page. Acceptable formats are REVTEX (preferred), LATEX, plain TEX; MS Word; PostScript figures. **Reprints** are offered for sale to authors.

For information about **subscription prices** and about the **online version** of the journal, see our Web server, or inquire at assocpub@aps.org. **Member** inquiries regarding **subscriptions**, renewals, address changes, missing or damaged copies, microfilm, and single-copy orders should be addressed to the APS Membership Department. **Institutional subscribers** should address subscription inquiries to APS Subscription Services. For address changes please send both old and new addresses, and if possible, send the mailing label from a recent issue.


**Copyright 2004 by The American Physical Society**

**Rights and Permissions**
**Copying**: No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the written permission of the publisher, except as stated below. Single copies of individual articles may be made for private use or research. Authorization is given to copy articles beyond the use permitted by Sections 107 and 108 of the U.S. Copyright Law, provided the copying fee of $22.50 per copy per article is paid to the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, USA.

**Reproduction** of an entire Article in a reprint collection, or for advertising or promotional purposes, or republication in any form requires permission from APS. Permission must be sought from the Associate Publisher, The American Physical Society, One Physics Ellipse, College Park, MD 20740-3844.

**Other Use**: Permission is granted to quote from the journal with the customary acknowledgment of the source. Permission must be sought from the APS Associate Publisher to reproduce a figure, table, or excerpt of an Article. Authorization for private use or research does not extend to systematic or multiple reproduction, to copying for promotional purposes, to distribution in any format, or to republication in any form. In all such cases, specific permission from APS must be obtained.



**Physical Review E [ISSN: 1539-3755 (print), 1550-2376 (online); CODEN PLEEE8; printed in USA] is published monthly by The American Physical Society, 1 Research Road, Box 9000, Ridge, NY 11961-9000.**

**POSTMASTER: Send address changes to Physical Review E, APS Subscription Services, Suite 1NO1, 2 Huntington Quadrangle, Melville, NY 11747-4502. The 2004 print + online base price is $2375. Periodicals postage rates are paid at Huntington Station, NY, and additional mailing offices.**